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ABSTRACT

Because schemas are often defined imprecisely and intuitively, the term "schema" is often misapplied in research. Consequently, researchers may fail to understand the complete scope of the phenomenon they are studying. Discussions of children's gender schema development and the influence of the gender schema on children's social information processing are adversely affected by such ambiguity. Gender schema approaches contain two primary, interrelated views of schema: (1) a knowledge-based approach predominantly concerned with developmental changes in children's amount and type of gender-based knowledge; and (2) a process-based approach mostly concerned with how, when, and why children's gender-based knowledge and attitudes influence their encoding, retrieval, and storage of gender-relevant information. Research has shown that although children's amount of gender-based knowledge consistently increases through early childhood, older children demonstrate substantial individual differences in their use of the gender dimension to classify and organize social information. It is unclear how the knowledge and application of gender schema are related. But research strongly suggests that gender schema and gender-role development do not constitute a unitary construct. (RH)

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# When is a Schema not a Schema?

## The Case of Gender Schema[1]

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# When is a schema not a schema? The case of gender schema

The notion of schemas as organized knowledge structures about a given concept is now ingrained in virtually all fields of psychology (viz., Brewer & Nakamura, 1984; Rumelhart, 1984). However, some researchers of social cognition have asserted that the term schema has come to acquire a more narrow meaning, with greater interest directed toward the examination of the development of schemas as knowledge-based structures (e.g., Martin & Halverson, 1987; Ruble & Stangor, 1986).

Coexistent with such knowledge-based orientations to schema are what might be termed more process-oriented models of social cognition which are less concerned with persons' actual amount of schema knowledge, per se. The latter, process-based approaches typically view schemas more dynamically, as cognitive structures sensitive to social context which influence the processing of information, and allow the active perceiver to make sense of the surrounding environment in an inferential and interactive manner (Martin & Halverson, 1981; Roopnarine & Mounts, 1987; Rumelhart, 1984; Signorella, 1987).

Recently, Scholnick (1983) has commented that descriptions of schemas frequently mix notions of schema as knowledge-based and schematic process. Indeed, a great amount of literature has commonly assigned a "mixed bag" definition to schemas, not clearly delineating conceptualizations of schemas as agents which influence information processing as well as compositions of knowledge (Ruble & Stangor, 1986; Scholnick, 1983).

It is posited that because schemas are often defined imprecisely

and intuitively, the term "schema" is often misapplied in research. Consequently researchers may fail to understand and appreciate the complete scope of the phenomenon they are studying (Martin & Halverson, 1987). Specifically, it is proposed that discussions of children's gender schema development and the influence and application of the gender

schema on children's social information processing are victims of this ambiguity.

The schema notion has only recently been applied to models of gender-role acquisition and development (e.g., Bem, 1981, 1984; Liben & Signorella, 1980, 1987; Martin & Halverson, 1981, 1987; Ruble & Stangor, 1986). As previously mentioned, gender schema approaches contain two primary but interrelated views of schema; 1) a knowledge-based approach predominately concerned with developmental changes in children's amount and type of gender-based knowledge, and 2) a process-based approach mostly concerned with how, when and why children's gender-based knowledge and attitudes influences their encoding, retrieval, and storage of gender-relevant information (viz., Stangor & Ruble, 1987).

Traditionally, gender schema have been viewed as a person's (in this case child's) knowledge, attitudes, and understanding of gender-based distinctions; that is, of the societal standards and stereotypes for females and males (e.g., Bem, 1981, 1984). Possibly as an outgrowth of Kohlberg's (1966; Kohlberg & Ullian, 1974) seminal cognitive developmental formulation of gender-role development, derived in part from a Piagetian approach, early investigations of children's gender schemas

frequently explored gender schema development from a quantitative, knowledge-based orientation (see Huston, 1985a for a review). Consequently, early gender-role research frequently employed gender-role knowledge measures as indices of "gender schema" (Huston, 1985a; Mischel, 1970).

Analyses of Kohlbergian theory are relevant to discussions of gender schema development, that is to conversations of gender-based knowledge and children's processing of gender-relevant information (Carter & Levy, 1988; Levy & Carter, 1985; Ruble & Stangor, 1986; Stangor & Ruble, 1987). This is so because Kohlbergian theory strongly emphasizes that children actively prefer gender-typed toys and activities because of their significant knowledge of such gender-role stereotypes. Kohlbergian models of gender-role development affirm firm comprehension of gender constancy, (i.e., the understanding that one's sex remains constant over time and situation) which proposedly emerges around the ages 6 to 7 years forms the essential basis for children's gender-typing.

However, contradictory to Kohlbergian theory, a substantial number of studies have documented that children lacking gender constancy or who often cannot even consistently identify or label themselves as male or female (i.e., display a rudimentary understanding of gender identity) express a broad awareness and use of the gender dimension and gender-relevant information (e.g., Carter & Levy, 1988; Kuhn, Nash, & Brucken, 1977; Ruble & Stangor, 1986; Stangor & Ruble, 1987; Weinraub, Clemens, Sockloff, Ethridge, Gracely, & Meyers, 1984).

What are the implications of such findings for gender schema approac-

hes to gender-role acquisition and development? First, it is now apparent that sophisticated gender knowledge may not be completely necessary for children to facilely apply the gender dimension as a means to encode, organize, and retrieve social information (viz., Carter & Levy, 1988; Huston, 1985a; Signorella, 1987). Second, children's acquisition of some amount of gender-based knowledge is now viewed as necessary but not sufficient for children to apply the gender dimension in their social information processing (Bem, 1981; Fagot, 1985; Huston, 1985ab; Martin & Halverson, 1981; 1987).

Unfortunately, a large portion of gender-role research has failed to address important questions concerning children's use of the gender schema, or the relative salience of the gender schema as a means to organize and perceive social information (cf., Higgins & King, 1981). Simply stating that children acquire gender-based knowledge does not address the question of how and why they attend to and apply the gender dimension over other social categories (Bem, 1981; Fagot, 1985; Roopnarine & Mounts, 1987). Hence, it is critical that we begin to understand not only the developmental paths concerning how much and what types of gender-relevant knowledge children acquire but also when and how such knowledge is actively accessed and used by children to process social information (Levy, 1987; Ruble & Stangor, 1987).

Building on the fundamental research base provided by knowledge-based approaches to gender schema development, some researchers now envision the gender schema in a more process-oriented manner (e.g., Carter & Levy, 1988; Martin & Halverson, 1981, 1987; Liben & Signorella, 1980). Process-based models of gender schema concur that gender-typing derives

largely from a generalized readiness by individuals to encode and organize information along gender lines; what has been termed gender schematic processing (e.g., Bem, 1981, 1984; Carter & Levy, 1988; Levy & Carter, 1985; Huston, 1985a; Martin & Halverson, 1987; Signorella, 1987).

These process-oriented approaches suggest that investigations of children's gender-role acquisition and development should not only examine children's apparently stoic aptitude at acquiring gender-based knowledge; they should also examine how gender schemas guide children's social information processing, and account for why the gender dimension gains processing primacy over other social categories, such as age or race (e.g., Bem, 1981, 1984, 1987; Fagot, 1985). As previously discussed however, the quantity or type of gender-relevant knowledge needed by young children to foster gender schematic processing has not been clearly delineated, nor has the general cognitive developmental character of gender schemas and gender schematic processing (Levy, 1987).

Research has shown that although children's amount of gender-based knowledge consistently increases through early childhood, older children demonstrate substantial individual differences in their use of the gender dimension to classify and organize social information (Signorella & Liben, 1980; Huston, 1985a; Martin & Halverson, 1987; Ruble & Stangor, 1986). Specifically, gender-role researchers have observed that the behaviors and social cognitions of young, pre-gender constant children, who lack an extensive or sophisticated amount of gender-based knowledge, are often strongly guided by gender-relevant

notions (Huston, 1985ab; Katz, 1979). In contrast, the behaviors and social cognitions of older, gender constant children who possess more comprehensive gender-based knowledge do not appear as consistently guided by gender-relevant notions.

What are we to make of these patterns? At present, it is unclear how these knowledge and application components of gender schema are related (e.g., Carter & Levy, 1988; Huston, 1985a; Martin & Halverson, 1987; Signorella, 1987). The quantity or type of gender-relevant knowledge needed to enable gender schematic processing in young children, or the general cognitive developmental character of gender schemas and gender schematic processing are not yet clearly understood (e.g., Huston, 1985b; Martin & Halverson, 1987). Understandably, children must hold some knowledge in a given domain to employ it, as what has been termed a cognitive organizing factor (Bem, 1981). But is there a specific amount of gender-based knowledge a child must possess in order to use, or not use, the gender dimension in their social information processing? Does a child's amount of gender-based knowledge necessarily mediate the saliency of the gender category or the predisposition to apply it? Do other developmental factors such as general cognitive development or social experience also referee children's gender schematic processing (e.g., Levy, 1987)? It appears that research and theory regarding the development of children's script-based knowledge may have inadvertently addressed some of the above questions.

Scripts are cognitive representations which contain information concerning the actions and roles people play in particular situations (Nelson, 1981, 1983ab). Nelson and others have stated that children

initially acquire a general representation of an event and then apply that "template" in order to comprehend ambiguous situations (Hudson & Nelson, 1983; Mandler, 1978, 1984; Nelson, 1983ab; Nelson & Gruendel, 1983). Although this template of script-based knowledge becomes increasingly decontextualized with respect to its initial experience of acquisition, Nelson (1981, 1983ab) contends that the original conceptual structure of the script template continues to guide young children's cognition.

Might young children also do the same with gender-based knowledge, mapping what little knowledge they possess onto a complex social world? Might it be that similar to script acquisition, children's gender schematic processing is initially directed by a small but, very salient, amount of gender-based knowledge? The beliefs that a small amount of, or single aspect of, information may serve to organize other related information and Nelson's discussions concerning script development mesh with Bem's explanations of gender schema development.

Bem (1981, 1984) contends that in addition to simply learning gender-based content, children are also implicitly and explicitly motivated to invoke their "network" of gender-relevant knowledge to organize and process novel information. Note that in both Nelson's and Bem's proposals no absolute amount or quality of knowledge (be it script or gender-based) is deemed imperative in order for children to use a certain dimension or category to organize information.

In an attempt to examine the functional relations between gender-based knowledge and gender schematic processing, Carter and Levy (1988) developed a reaction time measure of children's toy preferences which

permits examination of the degree to which children choose particular gender-typed toys based on the gender dimension. This tendency for children to choose toys based on the gender dimension has been termed degree of gender schematization (Carter & Levy, 1988; Carter, Levy, & Cappabianca, 1983; Levy & Carter, 1985).

Briefly, in this task children are presented with a pair of two toys and asked to indicate the one they most prefer. High and low gender schematic children's responses to specific pairs of gender-typed toys are assumed to systematically differ. Children whose toy choices are strongly guided by gender-based notions (i.e., highly gender schematic children) should find it difficult to choose between two toys from the same gender-typed category (e.g., two masculine toys), and this dilemma should be manifested in a longer reaction time. Conversely, highly gender schematic children should find it easier to choose between two toys from different gender-typed categories (e.g., a masculine versus a feminine toy) resulting in a shorter response time.

Interestingly, in a series of studies Carter and Levy have found that children's gender schematization, and not their amounts of gender-based knowledge or gender constancy, best predicted children's memories for gender-typed information, gender-role stereotype attributions, and their preferences for gender-typed toys and activities (Carter & Levy, 1988; Levy & Carter, 1985). Thus even if a child's amount of gender-based knowledge may be small, such a child apparently can and does use the gender dimension as a means to remember and make decisions about gender-relevant information. On the other hand, children exhibiting a substantial amount of gender-based knowledge apparently did not

consistently use apply such knowledge in their social information processing (Carter & Levy, 1988).

In sum, these results suggest that the apparent salience and accessibility of the gender dimension to children, and not necessarily their amount of gender-based knowledge per se, is substantially influencing preschooler's processing of gender-relevant information (Signorella, 1987). However, one might now begin to speculate about the developmental implications associated with gender schematic processing. For instance, does being more or less gender schematic affect younger and older children comparably?

In a study of preschoolers' recognition memories for gender-typed portrayals, Levy (1987) observed several interactions between children's age and degree of gender schematization (as assessed by the Carter and Levy toy preference measure). As can be seen in Figure 1, a high degree of gender schematization was associated with better memories for gender-typed content by young, 3 to 4 year-old preschoolers. In contrast, gender schematization did not clearly mediate older children's memories in such a consistent manner.

These results suggest that younger and older children's processing of gender-typed information may be differentially influenced by the gender dimension/schema. It is proposed that children's processing of gender-relevant information is mediated by their cognitive and mnemonic capabilities and the classification schemes most readily available to them (Brown, 1975; Flavell, 1971; Mandler, 1984). In the case of younger children this organizing factor may have been the gender schema. Perhaps there are both developmental and individual differences

in children's accessibility to and application of the gender schema, as well as amounts of gender-based knowledge.

In conclusion, it is apparent that gender schema or gender-role development is not a unitary construct, based solely on children's understanding of gender constancy, or their amount of gender-based knowledge, per se (Downs & Langlois, 1988; Huston, 1985ab). This is not to say that the findings or concerns of the knowledge- and process-based approaches to gender-role and gender schema development are in opposition. On the contrary, each approach has contributed significantly to the study of gender-role development. However, many questions regarding gender-role and gender schema development still remain unanswered, and unasked.

First, researchers are still addressing the issue of why the gender dimension is such a salient and meaningful dimension to children, despite cultural and parental attempts to downplay its significance (Bem, 1983; 1987; Fagot, 1985; Roopnarine & Mounts, 1987). Second, future gender schema research might examine how and why the influence of the gender schema or the salience of the gender dimension changes relative to a child's age and amount of gender-based knowledge (e.g., Ruble & Stangor, 1986; Stangor & Ruble, 1987).

Last and most importantly, researchers should heed Scholnick's (1983) cogent insights regarding mixing notions of schema as knowledge and schema as process. To appreciate the complexity of early gender-role development, theories of gender schema/gender-role development must recognize the unique interdependence and independence between children's gender-based knowledge and their tendency to use the gender-role

dimension to organize and structure their social world (Bem, 1981, 1984; Carter & Levy, 1988; Constantinople, 1979; Fagot, 1985; Huston, 1985ab; Liben & Signorella, 1987).

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Figure 1

Effects of age and gender schematization on children's memories for gender-role stereotype consistent portrayals

# CHILDREN'S RECOGNITION MEMORY ACCURACIES FOR GENDER–ROLE CONSISTENT PORTRAYALS AS A FUNCTION OF AGE AND GENDER SCHEMATIZATION